

LISTING OF CLAIMS

1. (currently amended) A method of monitoring the condition of a pump, or a component of a system ~~comprising~~ having a pump ~~which~~ wherein the component is not a component of the pump, the method comprising the steps of:
generating a predetermined test condition in the pump or system component; and
obtaining signals indicative of a condition of the pump or system during a period in which the test condition is present.
2. (currently amended) A ~~The~~ method as claimed in claim 1, wherein ~~said the~~ step of generating a predetermined test condition comprises generating an abnormal load condition whereby ~~said the~~ pump or system component is subject to an increased stress as compared with normal operating stresses.
3. (currently amended) A ~~The~~ method as claimed in claim 2, wherein ~~said the~~ step of generating a predetermined test condition comprises causing a reduction in clearance between parts of the pump and ~~said obtaining the~~ signals ~~are obtained during~~ a period in which ~~said the~~ reduction in clearance is present.
4. (currently amended) A ~~The~~ method as claimed in claim 3, wherein ~~said the~~ pump has a rotor and a stator and the clearance that is reduced is a clearance between the rotor and the stator.
5. (currently amended) A ~~The~~ method as claimed in claim 4, wherein ~~said the~~ clearance is reduced ~~at least in part~~ by selective control of rotational speed of ~~said the~~ rotor.
6. (currently amended) A ~~The~~ method as claimed in claim 5, wherein ~~said the~~ reduction in clearance is ~~at least in part~~ caused by the steps of causing a predetermined reduction in rotor rotation speed from a selected speed for a predetermined period of time and then

causing a predetermined increase in rotor rotation speed above ~~said-the~~ selected speed for a predetermined period of time.

7. (currently amended) A-The method as claimed in ~~any one of claims 3 to 6~~, wherein ~~said~~ the pump is provided with a cooling system and ~~said-the~~ reduction in clearance is ~~at least in part~~ caused by controlling a rate of flow of coolant to cause a perturbation of temperature in ~~said-the~~ pump.
8. (currently amended) A-The method as claimed in ~~any one of claims 3 to 7~~, wherein ~~said~~ the reduction in clearance is ~~at least in part~~ caused by increasing a gas flow rate through ~~said-the~~ pump.
9. (currently amended) A-The method as claimed in ~~any one of the preceding claims 1~~, wherein ~~said-the~~ pump is driven by an electric motor and ~~said-the~~ signals provide an indication of the current supplied to ~~said-the~~ motor.
10. (currently amended) A-The method as claimed in ~~any one of the preceding claims 1~~, wherein the system component comprises a conduit connected with the pump, and ~~said~~ the system condition is a condition of ~~said-the~~ conduit.
11. (currently amended) A-The method as claimed in claim 10, wherein ~~said-the~~ step of generating a predetermined test condition comprises generating a predetermined test flow rate in ~~said-the~~ conduit that is greater than a normal operating flow rate through ~~said-the~~ conduit.
12. (currently amended) A-The method as claimed in claim 11, further comprising obtaining ~~said-the~~ signals indicative of a condition of the system by means of a pressure sensor arranged to sense pressure in ~~said-the~~ conduit.

13. (currently amended) A-The method as claimed in claim 11-~~or 12~~, wherein ~~said~~the test flow rate in ~~said~~the conduit is generated by injecting a ~~pressurised~~-pressurized flow into ~~said~~the conduit.
14. (currently amended) A-The method as claimed in claim 11, ~~12 or 13~~, wherein ~~said~~the test flow rate is generated by injecting a ~~pressurised~~-pressurized gas flow into ~~said~~the pump.
15. (currently amended) A-The method as claimed in ~~any one of the preceding claims 1~~, wherein the pump or apparatus with which the pump is associated is equipped to store ~~said~~the signals
16. (currently amended) A-The method as claimed in ~~any one of the preceding claims 1~~, wherein ~~said~~the signals are transmitted to a storage location via a LAN or the internet.
17. (currently amended) A-The method as claimed in ~~any one of the preceding claims 1~~, wherein ~~said~~the signals are ~~analysed~~-analyzed to assess the condition of the pump or system component.
18. (currently amended) A-The method as claimed in claim 17, wherein ~~said~~the ~~analysing~~analyzing step comprises comparing ~~said~~the signals with signals obtained during at least one previous predetermined test condition of the pump or system component.
19. (currently amended) A-The method as claimed in claim 17-~~or 18~~, wherein ~~said~~the ~~analysing~~-analyzing step comprises comparing ~~said~~the signals with pre-programmed data.
20. (currently amended) A-The method as claimed in claim 17, ~~18 or 19~~ wherein ~~said~~the ~~analysing~~-analyzing step comprises comparing ~~said~~the signals with signals obtained from at least one other pump or like system component of another system during at least one predetermined test condition of the ~~or each~~ other pump or system component.

21. (currently amended) A-The method as claimed in ~~claim any one of claims 17 to 20~~, wherein ~~said~~the ~~analysing-analyzing~~ step comprises inputting ~~said~~the signals into an algorithm to provide a prediction of pump or system component condition.
22. (currently amended) A-The method as claimed in ~~any one of claims 17 to 21~~, wherein ~~said~~the ~~analysing-analyzing~~ step comprises inputting ~~said~~the signals into an algorithm to provide a prediction of pump or system component life until a predetermined condition of the pump or system component will occur.
23. (currently amended) A-The method as claimed in ~~any one of claims 17 to 22~~, wherein signals indicative of a system component condition are obtained and ~~said~~the ~~analysing-analyzing~~ step includes using ~~said~~the signals to predict a condition of the pump or system.
24. (currently amended) A-The method as claimed in ~~any one of claims 17 to 23~~, further comprising providing an audible indication of the result of ~~said~~the ~~analysing-analyzing~~ step.
25. (currently amended) A-The method as claimed in ~~any one of claims 17 to 24~~, further comprising providing a visual indication of the result of ~~said~~the ~~analysing-analyzing~~ step.
26. (currently amended) A-The method as claimed in ~~any one of claims 17 to 25~~, wherein ~~said~~the pump or system is automatically closed down if ~~said~~the ~~analysing-analyzing~~ step indicates a predetermined condition of the pump or system component.
27. (currently amended) A-The method as claimed in ~~any one of the preceding claims 1~~, wherein the pump or apparatus with which the pump is associated is able to determine whether the pump or system is in a condition that permits testing of the pump or system component, ~~and to cause the implementation of the steps of any one of the preceding claims if said condition permits testing of the pump or system component condition.~~

28. (currently amended) A-~~The~~ method as claimed in claim 27, wherein ~~said~~the determining step is performed at predetermined intervals.
29. (cancelled)
30. (cancelled)
31. (currently amended) Apparatus comprising a pump, pump controller and ~~at least one a~~ sensing device for sensing a pump operating parameter, ~~said~~the pump controller being able to control ~~said~~the pump so as to selectively generate a predetermined pump test condition and the ~~or each said~~ sensing device providing signals indicating values of ~~said~~the parameter when ~~said~~the test condition is generated.
32. (currently amended) Apparatus as claimed in claim 31, wherein ~~said~~the ~~at least one~~ sensing device comprises a current sensing device for sensing current supplied to a motor that drives ~~said~~the pump.
33. (currently amended) Apparatus as claimed in claim 31 ~~or 32~~, wherein ~~said~~the ~~at least one~~ sensing device comprises a pressure sensing device for sensing a pressure in ~~said~~the apparatus.
34. (currently amended) Apparatus as claimed in claim 31, ~~32 or 33~~, wherein ~~said~~the apparatus comprises a cooling system for ~~said~~the pump, ~~said~~the controller being operable to control ~~said~~the cooling system to generate a ~~said~~the predetermined test condition.
35. (currently amended) Apparatus as claimed in ~~any one of claims 31 to 34~~, wherein ~~said~~the controller is able to control pump speed to generate a ~~said~~the predetermined test condition.

36. (currently amended) Apparatus as claimed in ~~any one of claims 31 to 35~~, wherein said the apparatus comprises a source of ~~pressurised~~ pressurized gas and said the controller is able to cause a flow of gas from said the source to generate a ~~said the~~ predetermined test condition.
37. (currently amended) Apparatus comprising a pump, a controller, an exhaust conduit extending from said the pump, ~~at least one a~~ sensing device for sensing a condition in said the conduit, a connection associated with said the pump ~~and or~~ conduit for connecting said the pump ~~and or~~ conduit with a source of ~~pressurised~~ pressurized gas and valving for controlling flow of said the gas into said the pump ~~and/or~~ conduit, said the controller being able to control said the valving to selectively admit said the gas into said the pump ~~and/or~~ conduit so as to generate a predetermined test condition in said the conduit and ~~the or each~~ said sensor providing signals indicative of said the condition in the conduit when said the test condition is generated.
38. (currently amended) Apparatus as claimed in claim 37, wherein said the ~~at least one~~ sensing device comprises a pressure sensor for sensing gas pressure in said the conduit.
39. (currently amended) Apparatus as claimed in claim 37 ~~or 38~~, wherein said the controller is a controller for said the pump.
40. (currently amended) Apparatus as claimed in ~~any one of claims 31 to 36 or claim 39~~, wherein said the controller comprises a computer connectable with said the pump.
41. (currently amended) Apparatus as claimed in claim 40, wherein said the controller is connectable with the pump via a LAN or the internet.
42. (cancelled)